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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,192	BOFFA ET AL.	
	Examiner	Art Unit	
	STEVEN KELLEY	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *22-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *22-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6-9-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 22-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "high sensitivity" and "low sensitivity" are unclear as they are relative terms. Although the specification sets forth one definition of what "high sensitivity" means, there may be other interpretations of this term, thereby causing ambiguity in claim interpretation. Additionally, the specification does not set forth a definition of a "low sensitivity" front end receiver. The phrase that the first cells are "associated to at least 90% of a plurality of high sensitivity receiver front-ends", which is recited in claim 27 is unclear.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 22-32 and 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,094,580 to Yu et al. (hereinafter "Yu") in view of the IEEE article entitled "Evaluation of HTS Sub-Systems for Cellular Basestations" (hereinafter the "HTS article").

Regarding claim 22, Yu teaches a method for optimizing the positioning of high sensitivity receiver front-ends in a mobile telephony network of the CDMA type comprising a plurality of cells comprising the following steps: defining a first and a second cell indicator (see column 6, which teaches defining areas for cells, where a first indicator is amount of traffic in a potential cell and second indicator is a size of an area of a potential cell); defining a first and a second threshold (first threshold is a traffic threshold and second threshold is a size threshold, see step 258 in Fig. 6); comparing said first cell indicator with a first threshold value and said second cell indicator with a second threshold value (see column 7, lines 18-22 and step 258 in Fig. 6, which compares the amount of traffic in a cell to a traffic threshold value and compares the cell area size to an area threshold value); associating with a first category a plurality of first cells, each of said first cells having said first cell indicator greater than said first threshold value or said second cell indicator greater than said second threshold value (see step 260 in Fig. 6, which is "No" in step 258, where any quadrilateral (potential cell) which contains too much traffic or is to large (based on comparisons of indicators to thresholds as recited) is considered to be in a "first category" as recited).

As Yu teaches that any quadrilateral or potential cell (associated with a first category) should be partitioned into smaller quadrilaterals, Yu does not teach "positioning a

plurality of high sensitivity receiver front-ends substantially in all said plurality of first cells", as recited. In an analogous art, the HTS article teaches that high sensitivity receiver front ends may increase the amount of traffic handled in a cell and may also increase the size of a cell coverage area. Therefore, in order to increase the efficiency of a network (by reducing the amount of required cells), it would have been obvious to one of ordinary skill in the art to provide (recited "position") a high sensitivity receiver front end within any cell which has been determined (in step 258 of Yu) to contain either too much traffic or be too large, as high sensitivity receiver front ends will allow the cell to handle the additional traffic or expand the coverage area, as is conventional. Regarding claim 23, which recites "further comprising the steps of: associating with a second category a plurality of second cells, each of said second cells having said first cell indicator smaller than said first threshold value and said second cell indicator smaller than said second threshold value; and positioning a plurality of low sensitivity receiver front-ends substantially in all said plurality of second cells", see steps 258 and 262 in Fig. 6, which is "Yes" in step 258, where any quadrilateral (potential cell) which contains less traffic than the traffic threshold and has a size smaller than the threshold area (based on comparisons of indicators to thresholds as recited) is considered to be in a "second category" as recited. Additionally, as Yu would provide or position standard equipment (receiver front-ends) in these cells (i.e. not "high sensitivity receiver front ends") positioning a conventional receiver front-end reads on the recited "positioning of low sensitivity receiver front-ends substantially in all said plurality of second cells".

Regarding claim 24, which recites "wherein said step of defining for each cell a first and a second cell indicator, comprises the steps of: associating with said first cell indicator cartographic/morphological characteristics indicative of a traffic expectation for each cell; and associating with said second cell indicator cartographic/morphological characteristics indicative of a traffic expectation for each cell and of an expanse of geographic area whereon each cell stands", see column 6, lines 16-61, which teaches four different types of regions "having varying traffic capacity needs" (dense urban, urban, suburban and rural), which reads on the recited "associating with said cell indicator cartographic/morphological characteristics indicative of a traffic expectation for each cell".

Regarding claim 25, which recites "wherein said step of defining a first and a second threshold value comprises the step of selecting a pair of values for said first and second threshold value in such a way that said plurality of first cells is substantially equal in number to said plurality of high sensitivity receiver front-ends and said plurality of second cells is substantially equal to the difference between said plurality of cells and said plurality of first cells", this language essentially recites that the first and second values are chosen or defined in order to make the plurality (number) of first cells equal to the number of high sensitivity receiver front ends, which appears to be an obvious matter of design choice. For example, if a network includes 100 cells and there are 10 high sensitivity receiver front ends to be placed in these 100 cells, the first and second values should (obviously) be defined/chosen so that the "number of first cells" is 10.

Regarding claim 26, which recites "wherein said pair of values comprises a first and a

second value, said first and second value meeting the condition whereby the ratio between said first value and said second value is roughly equal to 1/15.+-.0.005", as described above in the rejection of claim 25, the ratio of the first and second values appears to be an obvious matter of design choice based on the number of cells and the number of high-sensitivity receiver front ends, which would determine and/or render obvious the value of the ratio between the first and second values, as recited.

Regarding claim 27, as described above in the rejection of claim 22, Yu teaches a mobile telephony network of the CDMA type comprising a plurality of cells, said plurality of cells comprising a plurality of first cells, each first cell having a first cell indicator greater than a first threshold value or a second cell indicator greater than a second threshold value, where the recited "first cells" are cells which has been determined (in step 258 of Yu) to contain either too much traffic or be too large.

As Yu teaches providing conventional receiver front ends, Yu does not teach that the first cells are "associated to at least 90% of a plurality of high sensitivity receiver front-ends", as recited. In an analogous art, the HTS article teaches that high sensitivity receiver front ends may increase the amount of traffic handled in a cell and may also increase the size of a cell coverage area. Therefore, in order to increase the efficiency of a network, it would have been obvious to one of ordinary skill in the art to provide (recited "position") a high sensitivity receiver front end within any cell which has been determined (in step 258 of Yu) to contain either too much traffic or be too large, as high sensitivity receiver front ends will allow the cell to handle the additional traffic or expand the coverage area, as is conventional. Regarding the recited "90% association",

language, it would be desirable to provide as close to 100% association of first cells to high sensitivity receiver front ends, but based on the number of "first cells" and the cost of high-sensitivity receiver front ends, it have been obvious to one of ordinary skill in the art to provide as close to 100% association (such s the recited 90%) of first cells to high sensitivity receiver front ends.

Regarding claim 28, which recites "comprising a plurality of second cells associated with a plurality of low sensitivity receiver front-ends, each second cell having said first cell indicator smaller than said first threshold value and said second cell indicator smaller than said second threshold value", see steps 258 and 262 in Fig. 6, which is "Yes" in step 258, where any quadrilateral (potential cell) which contains less traffic than the traffic threshold and has a size smaller than the threshold area (based on comparisons of indicators to thresholds as recited) is considered to be in a "second category" as recited. Additionally, as Yu would provide or position standard equipment (receiver front-ends) in these cells (i.e. not "high sensitivity receiver front ends") positioning a conventional receiver front-end reads on the recited "positioning of low sensitivity receiver front-ends substantially in all said plurality of second cells".

Regarding claim 29, which recites "wherein said first cell indicator is associated to cartographic/morphological characteristics indicative of a traffic expectation for each cell and said second cell indicator is associated to cartographic/morphological characteristics indicative of a traffic expectation for each cell and of an expanse of geographic area whereon each cell stands", see column 6, lines 16-61, which teaches four different types of regions "having varying traffic capacity needs" (dense urban,

urban, suburban and rural), which reads on the recited "associating with said cell indicator cartographic/morphological characteristics indicative of a traffic expectation for each cell".

Regarding claim 30, which recites "wherein each high sensitivity receiver front-end is inserted between a transceiver antenna and a base transceiver station, said high sensitivity receiver front-end being a cryogenic receiver front-end", see Fig. 1 of the HTS article which shows the high temperature superconductor (HTS) "high sensitivity cryogenic receiver front end" inserted between the main antenna and the base station ("indoor equipment") as recited.

Regarding claim 31, which recites "wherein said cryogenic receiver front-end comprises a cryostat that encloses a band-pass filter and a low noise amplifier mutually connected in cascade arrangement", see Fig. 1 of the HTS article which shows "a band-pass filter and a low noise amplifier (LNA) connected in cascade arrangement" as recited.

Regarding claim 32, which recites "wherein said band-pass filter is obtained with a technology based on high critical temperature superconducting materials", see the caption of Fig. 1 of the HTS article, which teaches that "the bandpass filter is made using HTS thin film devices".

Regarding claim 38, which recites "wherein each high sensitivity receiver front-end is inserted between a transceiver antenna and a base transceiver station said high sensitivity receiver front-end comprising at least a first and a second band-pass filter between which is inserted a low noise amplifier", although the HTS article shows only one bandpass filter, it would have been obvious to one of ordinary skill in the art to add

a second bandpass filter as recited, in order to further filter unwanted signals, as is conventional with high-sensitive equipment.

Regarding claim 39, which recites "wherein said plurality of cells is greater than a predetermined value", see column 18 of Yu which describes an example of a cell network which includes 128 cells and has been newly designed to include 97 cells and/or may be redesigned to include 118 cells, which reads on the recited number of cells is greater than 50 (where 50 is the recited "predetermined number").

Regarding claim 40, which recites "wherein said predetermined value is greater than 100", see column 18 of Yu which describes an example of a cell network which includes 118 cells.

Regarding claim 41, which recites "wherein said predetermined value is greater than 1000", although Yu gives an example (as described in column 18) of a network with approximately 100 cells, in larger areas and/or networks it is common to have networks with a larger number of cells. See for example, the second page of the HTS article which teaches a geographical area 146 x 162 km square and column 6 of Yu which teaches that the dimensions of a quadrilateral may be 0.5 km x 0.5 km. Therefore it would have been obvious (based on the network size of the HTS article and the cell sizes of Yu) to use the high sensitivity receiver front ends of the HTS article in Yu, in networks witch include more than 1000 cells as recited.

Regarding claim 42, which recites "wherein said predetermined value is greater than 500", see the above rejection of claim 41.

5. Claims 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yu and the HTS article as applied to claim 31 above, and further in view of U.S. Patent 6,263,215 to Patton et al. (hereinafter "Patton").

Regarding claim 33, which recites "wherein said cryogenic receiver front-end is mounted at such a distance from said transceiver antenna that losses due to antenna lead-in are negligible with respect to the noise figure introduced by said cryogenic receiver front-end", the HTS article does not specifically teach the details of the distance that the cryogenic receiver front-end is mounted from the transceiver antenna. In an analogous art, Patton teaches mounting a cryogenic receiver front-end near a transceiver antenna on an existing base station. Specifically, Patton teaches in the Summary of the Invention section in column 2, lines 26-28 to reduce cable loss and teaches in column 2, lines 58-63 that the cryostat is "substantially adjacent to the antenna to maintain the insertion loss...at or below a selected level". Therefore, as the HTS article does not go into the details of cryostat mounting, it would be obvious to mount the cryostat of the HTS article (as used in Yu) to reduce antenna lead in loss as recited, as is conventional (and as taught by Patton).

Regarding claim 34, which recites "wherein said cryogenic receiver front-end is mounted along an antenna lead-in in such a way as to minimize the overall noise figure of a receiver chain from said transceiver antenna to said base transceiver station", as Patton repeated teaches reducing losses of various types, it would have been obvious to one of ordinary skill in the art to mount the receiver front-end in a manner which would minimize overall noise as recited.

Regarding claim 35, which recites "wherein said cryostat operates at cryogenic temperatures lower than 200 degrees K", the HTS article does not specifically teach the temperature at which the cryostat operates. In an analogous art, Patton teaches specific details relating to the temperature of cryogenically cooled high sensitivity receiver front ends, which may be added to existing base stations. Specifically, Patton teaches in column 9, lines 55-60 that the cryostat may operate "at or below 77 K" and "at or below 90 K" which reads on the recited "temperatures lower than 200 degrees K". Therefore, as the HTS article does not go into the details of operation temperature, it would be obvious to operate the cryostat of the HTS article (as used in Yu) at the recited temperature as is conventional, for these types of devices.

Regarding claim 36, which recites "wherein said cryostat operates at cryogenic temperatures lower than 100 degrees K", see column 9, lines 55-60 of Patton which teach that the cryostat may operate "at or below 77 K" and "at or below 90 K" which reads on the recited "temperatures lower than 100 degrees K".

Regarding claim 37, which recites "wherein said cryostat operates at cryogenic temperatures higher than 60 degrees K", see column 9, lines 55-60 of Patton which teach that the cryostat may operate "at or below 77 K" and "at or below 90 K" which reads on the recited "temperatures higher than 60 degrees K".

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Kelley whose telephone number is (571) 272-5652. The examiner can normally be reached on Monday-Friday, 9AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SSK/

/Lester Kincaid/
Supervisory Patent Examiner, Art Unit 2617